



## Shutters Ensure Medical Services Continuity

### Full Mitigation Best Practice Story

#### *Mayaguez Municipio, Puerto Rico*

**Mayaguez, PR** - Gusting storm winds and heavy rain have always been a factor for the Bella Vista Hospital, which was built on top of a mountain in Mayaguez. Having to rush emergency medical services and expediting patient and personnel releases to avoid additional emergencies during severe storm events became crucial in the hospital's operational emergency plan. But that hectic situation changed four years ago.



During Hurricane Georges (1998), the normal operation of this private facility was significantly affected. Patients and hospital personnel were forced to evacuate to guarantee their safety. "We had rain water pouring into patient rooms, and that was unacceptable," said Olga Babilonia, the hospital's Assistant to the Executive Director.

After Hurricane Georges, the hospital's administration requested assistance from the FEMA Hazard Mitigation Grant Program (HMGP) to fund the installation of storm shutters. These shutters would prevent wind and water damages related to heavy rain and wind events.

The project included the installation of electric roll-down shutters in higher or hard-to-reach areas, manual accordion shutters for high but more accessible windows and regular aluminum panel shutters. "In previous disasters, the installation of any protective device, wood or metal, was a hassle and dangerous in some of the higher sections of the building. Now with the new system, we can close up during any rain event, without jeopardizing the operations. We combined different shutters, adjusting them to our specific needs, in a cost-effective way. And we are very satisfied with the results," explained Babilonia.

Another privately funded mitigation measure taken alongside this project was the acquisition of electrical generators to guarantee service continuity. "During Tropical Storm Jeanne (2004), we even received patients and people from other facilities, because with this project we ensured that during that kind of emergency, the operation of this hospital wouldn't be disrupted," said Babilonia.

The completion of this task was a joint effort between the public and private sectors to improve the preparedness, response and recovery of essential services and facilities. The hospital provided 25 percent of the cost of the project and FEMA provided the remaining 75 percent.

#### Activity/Project Location

Geographical Area: **Single County in a State**

FEMA Region: **Region II**

State: **Puerto Rico**

County: **Mayaguez Municipio**

City/Community: **Mayaguez**

### Key Activity/Project Information

Sector: **Public/Private Partnership**  
Hazard Type: **Severe Storm**  
Activity/Project Type: **Retrofitting, Non-structural**  
Activity/Project Start Date: **01/1999**  
Activity/Project End Date: **01/2001**  
Funding Source: **Hazard Mitigation Grant Program (HMGP); Private funds**  
Funding Recipient: **Critical Facility - Medical**  
Funding Recipient Name: **Bella Vista Hospital**  
Application/Project Number: **9999**

### Activity/Project Economic Analysis

Cost: **\$339,320.00 (Actual)**

### Activity/Project Disaster Information

Mitigation Resulted From Federal  
Disaster? **Unknown**  
Value Tested By Disaster? **Yes**  
Tested By Federal Disaster #: **No Federal Disaster specified**  
Year First Tested: **2004**  
Repetitive Loss Property? **Unknown**

### Reference URLs

Reference URL 1: <http://www.fema.gov/about/divisions/mitigation/mitigation.shtm>  
Reference URL 2: <http://www.nhc.noaa.gov/>

### Main Points

- During Hurricane Georges (1998), the normal operation of this private facility was significantly affected. Patients and hospital personnel were forced to evacuate to guarantee their safety.
- The project included the installation of electric roll-down shutters in higher or hard to reach areas, manual accordion shutters for high but more accessible windows, and regular aluminum panel shutters.
- Another privately-funded mitigation measure taken alongside this project was the acquisition of electrical generators to guarantee service continuity.



Side view of Bella Vista Hospital.



View of patient rooms with shutters.